

## Describing unexplored biodiversity: *Zootaxa* in the International Year of Biodiversity

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### Abstract

In the International Year of Biodiversity (2010), *Zootaxa* published 1,582 papers (including 92 monographs) in 405 issues, with a total of 32,330 pages. These papers included descriptions of 3,951 new taxa, of which 3,664 are of the species-group, 268 of the genus-group and 19 of the family-group. It is estimated that the total new animal species described in 2010 is most likely to be between 15,000 and 20,000, and *Zootaxa* has thus contributed 18 to 24% of the total.

The United Nations declared 2010 The International Year of Biodiversity, and this was celebrated throughout the world. It was a time to reflect on our achievements in the conservation and management of biodiversity, and to focus on the urgency of our challenge for the future. One of these challenges is the huge task of discovering and describing the 90% of the world's biodiversity that remains unknown to science. Governments of the world, through the Convention on Biological Diversity, have acknowledged the existence of a “taxonomic impediment” to the sound management of biodiversity, and have instituted the “Global Taxonomic Initiative” to remove it. Since the beginning of this century, *Zootaxa* has been helping taxonomists to overcome the taxonomic impediment by enabling them to describe new species in a rapid and efficient way (Zhang 2006a,b, 2008). Here I report on the contribution by *Zootaxa* to the description of new species during the International Year of Biodiversity.

In 2010, *Zootaxa* published 1,582 papers in 405 issues, with a total of 32,330 pages (Table 1). On average, each paper was about 20 pages in length, and each issue contained nearly four papers. During 2010, at least one issue with new taxa was published every day over 50 weeks, except weekends and public holidays. The number of papers increased in 2010 by 6% over that for 2009, whereas the total number of pages increased by 12%. Among the papers, 92 are monographs (at least 60 pages in length), representing a nearly 30% increase over that in 2009 (Table 1), which contributed to the increase of total pages in 2010. The largest monograph is a 1,064-page book by Taeger *et al.* (2010) on sawflies of the world, which provides references to the original descriptions and distributional data for 803 genera, 8,353 species and 161 subspecies. This is the second largest book published in *Zootaxa* (Zhang 2006a). The most prolific author, Prof Ding Yang of China, published 18 papers with co-authors in *Zootaxa* during 2010.

**TABLE 1.** The numbers of *Zootaxa* papers, monographs, issues and pages published in 2009 and 2010. Numbers for earlier years were summarized in Zhang (2008).

	Papers	Monographs	Issues	Pages
2009	1,488	71	360	28,858
2010	1,582	92	405	32,330

*Zootaxa* published a total of 3,951 new taxa in 2010; among them 3,664 are of the species-group, 268 of the genus-group and 19 of the family-group (Table 2). The species-group accounts for 92.7% of the total. The distribu-

tion of the number of new taxa among different taxonomic groups is highly aggregated. As expected, the Phylum Arthropoda accounts for the majority of the new species described (84.5%), and among them, the hexapods alone contribute 62.9% of the total (Table 2). Only eight taxa have more than 100 new species described: Coleoptera (501), Diptera (495), Hemiptera (320), Lepidoptera (286), Araneae (284), Crustacea (262), Hymenoptera (195), and Acari (191). Together they account for 69% of the total. Two top papers each contributed nearly 100 new taxa: 98 new taxa in Fibiger's (2010) revision of the subfamily Tactusinae (Lepidoptera: Noctuoidea) and 93 new taxa in Anderson's (2010) monograph of the Middle American leaf-litter inhabiting weevil genus *Theognete* (Coleoptera: Curculionidae).

**TABLE 2.** Numbers of new taxa of the species-genus to family-group described in *Zootaxa* during 2010.

	Number of new taxa		
	species-group	genus-group	family-group
<b>Arthropoda</b>	<b>3131</b>	<b>223</b>	<b>15</b>
<b>Hexapoda</b>	<b>2305</b>	<b>153</b>	<b>6</b>
<b>Insecta</b>	<b>2235</b>	<b>149</b>	<b>6</b>
Coleoptera	501	27	0
Diptera	495	25	1
Hemiptera	320	35	0
Lepidoptera	286	9	1
Trichoptera	209	2	0
Hymenoptera	195	32	3
Orthoptera	96	7	1
Odonata	30	3	0
Neuroptera	25	3	0
Ephemeroptera	15	3	0
Blattodea	13	1	0
Thysanoptera	13	1	0
Psocoptera	13	0	0
Plecoptera	11	0	0
Isoptera	3	0	0
Mecoptera	3	0	0
Phthiraptera	3	0	0
Mantodea	2	1	0
Raphidioptera	2	0	0
<b>Entognatha</b>	<b>70</b>	<b>4</b>	<b>0</b>
Collembola	42	3	0
Protura	25	1	0
Diplura	3	0	0
<b>Myriapoda</b>	<b>71</b>	<b>5</b>	<b>2</b>

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**TABLE 2** (continued)

		Number of new taxa		
		species-group	genus-group	family-group
<b>Arthropoda</b>	<b>Chelicerata</b>			
	<b>Arachnida</b>	<b>493</b>	<b>36</b>	<b>1</b>
	Araneae	284	11	0
	Acari	191	24	1
	Opiliones	13	1	0
	Scorpiones	2	0	0
	Pseudoscorpiones	1	0	0
	Ricinulei	1	0	0
	Solifugae	1	0	0
	<b>Crustacea</b>	<b>262</b>	<b>29</b>	<b>6</b>
<b>Mollusca</b>		75	6	1
<b>Annelida</b>		40	4	0
<b>Echinodermata</b>		37	6	0
<b>Bryozoa</b>		36	4	0
<b>Platyhelminthes</b>		26	4	0
<b>Nematoda</b>		24	3	0
<b>Coelenterata</b>		12	2	1
<b>Porifera</b>		9	0	0
<b>Nematomorpha</b>		7	0	0
<b>Tardigrada</b>		7	0	0
<b>Gastrotricha</b>		3	1	1
<b>Acanthocephala</b>		1	0	0
<b>Nemertea</b>		1	0	0
<b>Hemichordata</b>		11	3	0
<b>Chordata</b>		<b>243</b>	<b>12</b>	<b>1</b>
	<b>Urochordata</b>	<b>Asciidiacea</b>	7	0
	<b>Vertebrata</b>		<b>236</b>	<b>12</b>
		<b>Pisces</b>	88	1
		<b>Amphibia</b>	75	0
		<b>Reptilia</b>	63	7
		<b>Aves</b>	1	2
		<b>Mammalia</b>	9	2
<b>Protozoa</b>		1	0	0
<b>Total</b>		<b>3664</b>	<b>268</b>	<b>19</b>

To put these numbers into perspective, it should be noted that the numbers of new animal species and higher taxa described in the world, as indexed in *Zoological Record*, fluctuated between 14,108 and 17,820 per year between 1978 and 2009<sup>1</sup>. The State of Observed Species (SOS) Report<sup>2</sup> provides summary data for all new species described throughout the world in recent years: 16,969 new species in 2006 (2008 SOS Report), 18,516 new species in 2007 (2009 SOS Report) and 18,225 living species and 2,140 animal fossil species in 2008 (2010 SOS Report). The total number of new animal species described in 2010 will not be known for another year or two, but is most likely to be between 15,000 and 20,000, based on the above data. If those numbers are correct, *Zootaxa* has contributed 18% to 24% of the total new animal species described in 2010.

Total numbers of new species in 2010 are not available for most taxonomic groups, except for a few well data-based groups. AmphibiaWeb<sup>3</sup> monitors the number of new taxa each year in a timely manner, and listed 206 species in 2010 and 16 species in 2011 (up to 6 February 2011). If we assume that 20% more are missed in the current count (which is highly unlikely), then *Zootaxa* contributed 30% of the total new amphibian species described in 2010. Eschmeyer (2011) in his *Catalog of Fishes* electronic version (5 January 2011)<sup>4</sup>, indicated that 375 new species of fishes were described in 2010. Likewise, if we assume that 20% more are missed in the current count, *Zootaxa* has contributed about 20% of all new fish species described in 2010, which is in broad agreement with estimates for all animal taxa.

*Zootaxa* is one of the thousands of journals and books reporting new species, yet it has made a very significant contribution to understanding unexplored biodiversity in the International Year of Biodiversity.

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## References

- Anderson, R.S. (2010) A taxonomic monograph of the Middle American leaf-litter inhabiting weevil genus *Theognete* Chamberlain (Coleoptera: Curculionidae; Molytinae; Lymantini). *Zootaxa*, 2458, 1–127.
- Fibiger, M. (2010) Revision of the Micronoctuidae (Lepidoptera: Noctuoidea) Part 3, Taxonomy of the Tactusinae. *Zootaxa*, 2583, 1–119.
- Taeger, A., Blank, S.M. & Liston, A.D. (2010) World Catalog of Symphyta (Hymenoptera). *Zootaxa*, 2580, 1–1064.
- Zhang, Z.-Q. (2006a) The first five years. *Zootaxa*, 1111, 68.
- Zhang, Z.-Q. (2006b) The making of a mega-journal in taxonomy. *Zootaxa*, 1358, 67–68.
- Zhang, Z.-Q. (2008) Contributing to the progress of descriptive taxonomy. *Zootaxa*, 1968, 65–68.

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1. Data collected from *Zoological Record* (1998–2009) published by Thomson Reuters (<http://www.organismnames.com/>); animals here include Protozoa indexed in *Zoological Record*. These numbers include new names and new taxa. For *Zootaxa*, new names proposed for old taxa are not counted.
  2. The State of Observed Species (SOS) Report <http://www.species.asu.edu/SOS> issued by International Institute for Species Exploration annually in partnership with the International Plant Names Index (IPNI); Thomson Reuters (publisher of *Zoological Record*); and the *International Journal of Systematic and Evolutionary Microbiology* (Accessed: Feb 6, 2011).
  3. AmphibiaWeb: Information on amphibian biology and conservation. [web application]. 2011. Berkeley, California: AmphibiaWeb. Available: <http://amphibiaweb.org/> (Accessed: Feb 6, 2011).
  4. Eschmeyer, W.N. (ed.) (2011) Catalog of Fishes electronic version (5 January 2011). Available from <http://research.calacademy.org/ichthyology/catalog/fishcatmain.asp>